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10/034,380	01/03/2002	Eung Tae Kim	K-0387	8668

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EXAMINER	
AN, SHAWN S	
ART UNIT	**PAPER NUMBER**
2621	

DATE MAILED: 04/12/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/034,380	Applicant(s) KIM, EUNG TAE	
	Examiner Shawn S. An	Art Unit 2621	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *23 January 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,3-22,30 and 32-52* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,7,18,19,22,30,32-47 and 49-52* is/are rejected.

7)☒ Claim(s) *3-6,8-17,20,21 and 48* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____.

DETAILED ACTION

Request for Continued Examination

I. The request filed on 1/23/06 for a Request for Continued Examination (RCE) under 37 CFR 1.114 based on parent Application No. 10/034,380 is acceptable and a RCE has been established. An action on the RCE follows.

Response to Amendment

2. As per Applicant's instructions as filed on 1/23/06, claims 1 and 30 have been amended (filed on 12/19/05), claims 2, 23-29, and 31 have been canceled, and claims 42-52 have been newly added.

Response to Remarks

3. Applicant's arguments with respect to amended claims have been carefully considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 1, 30, 32-35, and 37-39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Eyuboglu et al (5,541,852) in view of Wine et al (5,253,041), Alvarez (6,898,243 B1), and Florencio et al (6,621,866 B1).

Regarding claims 1 and 30, Eyuboglu et al discloses a video transcoding apparatus (Fig. 6, 402), comprising:

a video decoder (602) for decoding a compressed video bit stream so as to reconstruct a pixel value of an original scene;

a frame memory (614) for storing the macro block;

a transcoding parameter control unit (616 via 602) detecting information about a picture from a previous bit stream VLD by the decoder and setting up an encoding mode (Inter/Intra) for a transcoding in accordance with the detected information (Fig. 6, col. 7, lines 6-20);

a video encoder (608) for encoding data stored in the frame memory (614) by macroblock unit in accordance with the encoding mode outputted from the transcoding parameter control unit;

Eyuboglu et al does not particularly disclose:

a video preprocessing unit having a predetermined matrix structure and down-sampling a macroblock decoded by the video decoder by transforming the macroblock into a corresponding picture structure, wherein the video preprocessing unit carries out down sampling through a field based processing if the data decoded in the video decoder corresponds to a frame picture in an interlacing sequence ***and*** the video preprocessing unit carries out down sampling through a frame based processing if the data decoded in the video decoder corresponds to a field picture structure having a sequential scanning sequence ***or*** <u>an interlacing sequence</u>; and

a bit rate control unit controlling quantization of the video encoder by calculating a bit amount encoded substantially by every picture among a bit stream to the decoded currently by the video decoder and finding a fullness of a buffer in the video encoder using the calculated bit amount.

However, Wine et al teaches a video transcoder comprising a video preprocessing unit (Fig. 7, 42) having a predetermined matrix structure (Fig. 3) and down-sampling a macroblock by transforming the macroblock into a corresponding picture structure to the compressed video bit stream (col. 3, lines 60-65), wherein the video preprocessing unit carries out down-sampling through a field based processing if video data corresponds to a frame picture in an interlacing sequence (abs.; col. 3, lines 47-59).

Further, Alvarez teaches a video preprocessing unit (Fig. 1, 111) carrying out down-sampling through a frame (progressive) based processing if video data corresponds to a field picture structure having an interlacing sequence (abs.; Fig. 2c).

Furthermore, Florencio et al teaches a video transcoder comprising a bit rate control unit (Fig. 3, elements 32, 34) controlling quantization (Fig. 10, 172) of the video encoder (174) by calculating a bit amount encoded (Fig. 11, 178) substantially by every picture (slice; picture comprises slices) among a bit stream to the decoded currently by the video decoder (32) and finding a fullness of a buffer in the video encoder (34) using the calculated bit amount (col. 4, lines 9-25).

Moreover, in an encoding standard such as MPEG, a field based processing utilizes an interlacing sequence, whereas a frame based processing utilizes a sequential (progressive) scanning sequence.

Therefore, it would have been obvious to a person of ordinary skill in the relevant art employing the transcoder as taught by Eyuboglu et al to incorporate the teachings of Wine et al and Alvarez so that the video preprocessing unit has a predetermined matrix structure and down-samples a macroblock decoded by Eyuboglu et al's video decoder by transforming the macroblock into a corresponding picture structure, wherein the video preprocessing unit carries out down sampling through a field based processing if the data decoded in the video decoder corresponds to a frame picture in an interlacing sequence and the video preprocessing unit carries out down sampling through a frame based processing if the data decoded in the video decoder corresponds to a field picture structure having an interlacing sequence for producing higher quality output, thereby avoiding such as alising, blurring, and other artifacts, and also incorporate the teachings of Florencio et al so that the frame memory stores the down sampled macroblock as an efficient way to control the bit rate in a transcoder.

Regarding claim 32, Wells et al teaches the video preprocessing unit transforming a block output from the video decoder into a smaller block (col. 11, lines 39-49).

Regarding claim 33, Wells et al teaches the video preprocessing unit carrying out 2-dimensional (vertical and horizontal) down sampling (col. 11, lines 39-49).

Therefore, it would have been considered an obvious design choice for Wells et al's video preprocessing unit to carry out 1-dimensional down sampling vertically or horizontally as desired by a user.

Regarding claims 34 and 35, according to MPEG-2 standard, each macroblock includes a 16x16 array of luminance samples and each block or array of 8x8 chrominance samples (col. 1, lines 44-49).

Therefore, it would have been obvious for Wells et al's video preprocessing unit to carry out down sampling of a luminance signal and a chrominance signalin order to conform with the encoding standard.

Regarding claims 37-39, Eyuboglu et al discloses inter/intra indicator (616). Furthermore, it is well known in the encoding standard that an I picture/frame is typically considered anchored picture, and therefore, intra-coded, and P (predictive) and B (bidirectional) picture are normally subject to motion compensation, and therefore inter-coded.

Therefore, it would have been obvious for the transcoding parameter control unit to control video encoder so as to intra-code macroblocks output from the frame memory when a currently decoded picture from the video decoder is an I picture, and carry out MC of previously decoded macroblocks corresponding to the macroblocks to be encoded currently when the currently decoded picture type output from the decoder is a P picture or a B picture.

As per claim 39, it would have been considered an obvious design choice for the transcoding parameter control unit to control video encoder so as to intra-code macroblocks to be encoded currently when at least 3 intra macroblocks exist in the previously decoded 4 macroblocks corresponding to the macroblock to be encoded currently for encoding efficiency as desired by a user.

6. Claims 42-43, 45-47, and 49-51 are rejected under 35 U.S.C. 103(a) as being unpatentable over Eyuboglu et al (5,541,852) in view of Wine et al (5,253,041) and Alvarez (6,898,243 B1).

Regarding claims 42 and 45-46, Eyuboglu et al discloses a video apparatus (Fig. 6, 402), comprising:

a video decoder (602) for decoding a video bit stream comprising macroblocks;

a frame memory (614) for storing the macro block; and

a transcoding parameter control unit (616 via 602) for detecting information about a picture (side information) from a previous bit stream VLD by the decoder (Fig. 6, 602) and setting up an encoding mode (Inter/Intra) (616) for a transcoding in accordance with the detected information (col. 7, lines 6-20).

Eyuboglu et al does not particularly disclose a video preprocessing unit carrying out a down sampling a macroblock decoded by the video decoder, wherein the video pre-processing unit performs down sampling using a field based processing when the data decoded in the video decoder corresponds to a frame picture and the video pre-processing unit performs down sampling using a frame based processing when the data decoded in the video decoder corresponds to a field picture structure.

However, Wine et al teaches a video preprocessing unit (Fig. 7, 42) for down-sampling data using a field based processing if video data corresponds to a frame picture in an interlacing sequence (abs.; col. 3, lines 47-59).

Furthermore, Alvarez teaches a video preprocessing unit (Fig. 1, 111) for down-sampling data using a frame (progressive) based processing if video data corresponds to a field picture structure having an interlacing sequence (abs.; Fig. 2c).

Moreover, in an encoding standard such as MPEG, a field based processing utilizes an interlacing sequence, whereas a frame based processing utilizes a sequential (progressive) scanning sequence.

Therefore, it would have been obvious to a person of ordinary skill in the relevant art employing the transcoder as taught by Eyuboglu et al to incorporate teachings of Wine et al and Alvarez so that the video preprocessing unit carries out a down sampling a macroblock decoded by Eyuboglu et al's video decoder, wherein the video pre-processing unit performs down sampling using a field based processing when the data decoded in the video decoder corresponds to a frame picture and the video pre-processing unit performs down sampling using a frame based processing when the data

decoded in the video decoder corresponds to a field picture structure for producing higher quality output, thereby avoiding such as alising, blurring, and other artifacts.

Regarding claim 43, Eyuboglu et al discloses a video encoder (Fig. 6, 606 and 608) for encoding data stored in the frame memory (614) by macroblock units in accordance with the encoding mode set up by the transcoding parameter control unit (616 via 602).

Regarding claim 47, Wine et al teaches transforming an 8 X 8 block into a 4 X 4 block (col. 3, lines 60-65).

Regarding claim 49, Eyuboglu et al discloses a video transcoding apparatus (Fig. 6, 402), comprising:

a video decoder (602) for decoding a video bit stream.

Eyuboglu et al does not particularly disclose a video preprocessing unit to down-sample data using a field based processing if the data decoded in the video decoder corresponds to an interlacing sequence having a frame picture ***and*** to down sample data using a frame based processing if the data decoded in the video decoder corresponds to a sequential scanning sequence ***or*** an interlacing sequence having a field picture structure.

However, Wine et al teaches a video preprocessing unit (Fig. 7, 42) down-samples data using a field based processing if video data corresponds to an interlacing sequence having a frame picture (abs.; col. 3, lines 47-59).

Furthermore, Alvarez teaches a video preprocessing unit (Fig. 1, 111) down-samples data using a frame (progressive) based processing if video data corresponds to an interlacing sequence having a field picture structure (abs.; Fig. 2c).

Moreover, in an encoding standard such as MPEG, a field based processing utilizes an interlacing sequence, whereas a frame based processing utilizes a sequential (progressive) scanning sequence.

Therefore, it would have been obvious to a person of ordinary skill in the relevant art employing the transcoder as taught by Eyuboglu et al to incorporate teachings of Wine et al and Alvarez so that the video preprocessing unit down-samples data using a field based processing if the data decoded in the video decoder corresponds to an

interlacing sequence having a frame picture ***and*** down samples data using a frame based processing if the data decoded in the video decoder corresponds to an interlacing sequence having a field picture structure for producing higher quality output, thereby avoiding such as alising, blurring, and other artifacts.

Regarding claim 50, Eyuboglu et al discloses a transcoding parameter control unit (Fig. 6, 616 via 602) for detecting information about a picture (side information) from another bit stream (602) and determining an encoding mode (Inter/Intra) (616) based on the detected information (col. 7, lines 6-20).

Regarding claim 51, by virtue of combination of references, it would be obvious that Eyuboglu et al's video encoder encodes the down sampled data (by Wine et al and Alvarez's preprocessors) by macroblock units based on the determined encoding mode (606 to 608 via encoding loop).

7. Claims 44 and 52 is rejected under 35 U.S.C. 103(a) as being unpatentable over Eyuboglu et al, Wine et al, and Alvarez as applied to claims 43 and 51 above, respectively, and further in view of Florencio et al (6,621,866 B1).

Regarding claims 44 and 52, the combination of Eyuboglu et al, Wine et al, and Alvarez does not particularly disclose a bit rate control unit for controlling the video encoder by calculating a bit amount among a bit stream to the decoded by the video decoder and a fullness of the video encoder based on the calculated bit amount.

However, Florencio et al discloses a bit rate control unit (Fig. 3, elements 32, 34) controlling quantization (Fig. 10, 172) of the video encoder (174) by calculating a bit amount encoded (Fig. 11, 178) substantially by every picture (slice; picture comprises slices) among a bit stream to the decoded currently by the video decoder (32) and finding a fullness of a buffer in the video encoder (34) using the calculated bit amount (col. 4, lines 9-25).

Therefore, it would have been obvious to a person of ordinary skill in the relevant art employing the transcoder as taught by Eyuboglu et al to incorporate teachings of Florencio et al as an efficient way to control the bit rate in a transcoder.

8. Claims 7 and 36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Eyuboglu , Wells et al, and Florencio et al as applied to claims 1 and 30 above, respectively, and further in view of Golin (6,058,143).

Regarding claims 7 and 36, Eyuboglu et al teaches a transcoding parameter control unit (616) and a motion vector (Fig. 6, see MOTION VECTORS) of a macroblock using motion information of a previous bit stream decoded by the video decoder (602).

Furthermore, Golin teaches a transcoding parameter control unit (Fig. 2, 205) and a motion vector of a macroblock using motion information of a previous bit stream decoded by the video decoder (202) (col. 3, lines 1-59). Golin also teaches multiple motion vectors being associated with a given block in some prediction (motion) modes, such as field prediction and dual prime for P-pictures, and deciding whether to use forward and/or backward prediction for B-pictures (col. 6, lines 27-39).

Therefore, it would have been obvious to a person of ordinary skill in the relevant art employing Eyuboglu et al's trancoding scheme to incorporate the teaching of Golin so that the transcoding parameter control unit establishes the motion vector and the motion mode of the macroblock down-sampled by Well et al's preprocessing unit using motion information of the previous bit stream variable length decoded by the video decoder as a most efficient way to determine a transcoding parameter.

9. Claims 18-19, 22, and 40-41 are rejected under 35 U.S.C. 103(a) as being unpatentable over Eyuboglu , Wells et al, and Florencio et al as applied to claim 1 above, and further in view of Applicant's admitted prior art.

Regarding claims 18 and 40, Eyuboglu et al discloses a video bit stream VLC in the video encoder (Fig. 6, 608).

Florencio et al teaches the bit rate control unit comprising picture bit counting unit (Fig. 11, 178) calculating a bit amount encoded substantially for each picture (slice; picture comprises slices) in a video bit stream inputted to the video decoder and to be encoded currently, and

a buffer in the video encoder (34) finding a target bit number (col. 4, lines 9-25).

for a picture to be encoded using the bit amount calculated by the picture bit counting unit and a video bit stream in the video encoder, and then calculating the fullness of the buffer in the video encoder (34) using the found target bit number (col. 4, lines 9-25).

the combination of Eyuboglu , Wells et al, and Florencio et al does not particularly disclose a reference quantizing parameter calculating unit calculating a reference quantizing parameter in accordance with buffer fullness outputted from the buffers;

an activity calculating unit producing an activity if a video outputted from the video decoder; and

quantizing parameter generating unit generating a quantizing parameter to be used for a substantial quantization in accordance with the calculated reference, quantizing parameter and the calculatd activity so as to control a quantization of the video encoder.

However, Applicant's admitted prior art teaches a reference quantizing parameter calculating unit (Fig. 1, 51) calculating a reference quantizing parameter in accordance with buffer fullness outputted from the buffer (40);

an activity calculating unit (52) producing an activity if a video outputted from the video decoder (10); and

quantizing parameter generating unit (53) generating a quantizing parameter to be used for a substantial quantization in accordance with the calculated reference, quantizing parameter and the calculated activity so as to control a quantization (Q) of the video encoder.

Therefore, it would have been obvious to a person of ordinary skill in the relevant art employing the transcoder as taught by Eyuboglu et al to incorporate the teaching of the Applicant's admitted prior art so that the reference quantizing parameter calculating unit calculates a reference quantizing parameter in accordance with buffer fullness outputted from the buffer, an activity calculating unit produces an activity of a video outputted from the video decoder, and quantizing parameter generating unit generates a quantizing parameter to be used for a substantial quantization in accordance with the calculated reference, quantizing parameter and the calculated activity so as to control a

quantization (Q) of the video encoder as an efficient way to determine a transcoding parameter.

Regarding claims 19 and 41, Eyuboglu et al discloses a picture_start_code (col. 10, lines 32-33) in the video bitstream.

Florencio et al teaches the bit rate control unit comprising picture bit counting unit (Fig. 11, 178).

Therefore, it would have been obvious to a person of ordinary skill in the relevant art employing the transcoder as taught by Eyuboglu et al to incorporate the teaching of the Florencio et al so that the picture bit counting unit detects a picture_start_code in the video bitstream inputted to the video decoder and counts to output a bit number between the detected picture_start_code and a next picture_start_code, as an efficient way to control the bit rate.

Regarding claim 22, Applicant's admitted prior art teaches the activity calculating unit receiving an output from the frame memory (Fig. 1, 20), finds the activity of the macroblock to be encoded currently, and outputs the normalized activity to the quantizing parameter generating unit (50)(page 9, [0027]).

Furthermore, the Examiner takes official notice that determining a value of an average activity of a macroblock to be encoded/decoded is well known in the art. (see, Horiike et al, (6,044,115)).

Therefore, it would have been obvious to a person of ordinary skill in the relevant art employing the transcoder as taught by Eyuboglu et al to incorporate the teaching of the Applicant's admitted prior art and the Examiner's official notice so that the initial value of an average value of the activities used for the activity normalization is set up by finding an average activity of a macroblock to be decoded into an original resolution, as an efficient way to control the bit rate.

Allowable Subject Matter

10. Claims (3-6, 8-17, 20-21) and 48 are objected to as being dependent upon a rejected base claims 1 and 42, respectively, but would be allowable:

if any one of the claims 3, 8, and 20 is rewritten in independent form including all of the limitations of the base claim 1 and any intervening claims; and

if claim 48 is rewritten in independent form including all of the limitations of the base claim 42 and any intervening claims.

Dependent claims 3-6, 8-17, 20-21, and 48 recite novel features, wherein the prior art of record fails to anticipate or make obvious novel features.

Accordingly, if the amendments are made to the claims listed above, and if rejected claims are canceled, the application would be placed in condition for allowance.

Conclusion

11. Any inquiry concerning this communication or earlier communications from the Examiner should be directed to *Shawn S. An* whose telephone number is 571-272-7324.

12. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

13. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

SSA

SHAWN AN
PRIMARY EXAMINER

4/7/06